

WHAT IS CLAIMED IS:

1. An instrument for inserting an intervertebral implant into an intervertebral space, comprising:

a pair of arms connected to each other and including an upper arm and a lower arm, said arms being closeable towards each other to secure an intervertebral implant therebetween and separable away from each other,

each arm including at its outer end a recess engaging portion adapted to be inserted in a recess of the intervertebral implant.

2. An instrument according to claim 1, said arms being connected to a crossed linkage to close and separate the arms toward and away from each other.

3. An instrument according to claim 2, said crossed linkage operatively connected to the upper and lower arms and also operatively connected to a threaded rod, thread engaging means on the instrument, such that movement of the threaded rod in one direction moves the crossed linkage to separate the arms and movement of the threaded rod in the other direction closes the arms.

4. An instrument according to claim 3, including a polygonal cross section non-threaded rod connected to the threaded rod and extending into a knob at the end of the instrument opposite from the arms, wherein turning movement of the polygonal rod turns the threaded rod to advance it to operate the crossed linkage.

5. An instrument according to claim 3, wherein the threaded rod threadedly engages the instrument at a beveled washer which engages the threads when the rod is moved to the position to separate the arms and which allows the threads to slip past the beveled washer in the opposite direction to close the arms without turning the threaded rod.

6. An instrument according to claim 3, wherein the rod threadedly engages the body at a tapered nut which engages the threads to cause turning movement of the rod when the rod is moved to the position to separate the arms, and allows the threads to move in the opposite direction, permitting movement of the threaded rod without turning of same to close the arms.

7. An instrument according to claim 1, said arms being connected to a body and being of a resilient material, such that opposing such natural resiliency separates the arms from each other.

8. An instrument according to claim 7, including a pin in the space between the arms, said pin located in a pin recess to allow the arms to close together.

9. An instrument according to claim 8, including a thumb slide on the body and engageable with said pin, whereby movement of the thumb slide while the pin is in the pin recess moves the pin out of the pin recess to separate the arms.

10. An instrument according to claim 1, wherein the upper and lower arms are pivotally connected to each other intermediate between the forward ends which engage the implant and the rear ends thereof.

11. An instrument according to claim 10, including a spacer mounted between the upper and lower arms for engaging the implant as the upper and lower arms secure the implant.

12. An instrument according to claim 11, wherein the spacer is removably mounted in the instrument such that different size spacers can be used.

13. An instrument according to claim 11, including a spacer tube located generally coplanar with the upper and lower arms at the forward ends thereof and located therebetween.

14. An instrument according to claim 13, including a spacer removably mounted in the spacer tube such that its forward end engages the implant.

15. An instrument according to claim 14, wherein the spacer is sufficiently thick to move the upper part to a lordosis angle.

16. An instrument according to claim 14, wherein the spacer is sufficiently thin to allow the upper part to move to a kyphosis angle.

17. An instrument according to claim 11, including flat portions on the upper and lower arms to engage the spacer as the arms are moved together.

18. An instrument according to claim 17, including engaging means between the spacer and its adjacent flat portions.

19. An instrument for inserting an intervertebral implant into an intervertebral space, comprising:

a pair of arms connected to each other and including an upper arm and a lower arm, said arms being closeable towards each other to secure upper and lower parts of an intervertebral implant therebetween and separable away from each other,

and a spacer located between the arms to limit movement of the upper and lower parts towards each other when securing the implant.

20. An instrument according to claim 19, wherein the upper and lower arms are pivotally connected to each other intermediate between the forward ends which engage the implant and the rear ends thereof.

21. An instrument according to claim 20, wherein the spacer is removably mounted in the instrument such that different size spacers can be used.

22. An instrument according to claim 21, including a spacer tube located generally coplanar with the upper and lower arms and located therebetween, and including a spacer removably mounted in the spacer tube such that its forward end engages the implant.

23. An instrument according to claim 22, including flat portions on the upper and lower arms which engage the spacer as the arms close together.

24. An instrument for inserting an intervertebral implant into an intervertebral space comprising:

a pair of arms pivotally connected together at a single pivot connection such that the arms move relative to each other about said pivot connection in the manner of a scissors, and including an upper arm and a lower arm at the forward ends, said arms at the forward end being closable towards each other to secure an intervertebral implant therebetween and to separate away from each other,

the upper and lower arms at their forward ends including means for engaging the upper and lower parts, respectively, of an intervertebral implant.

25. An instrument according to claim 24, including a spacer located between the arms to limit movement of the upper and lower parts towards each other.

26. An instrument according to claim 25, including a spacer tube generally coplanar with the upper and lower arms and located therebetween for receiving the spacer.

27. An instrument for inserting an intervertebral implant into an intervertebral space, comprising:

a body and a pair of resilient arms connected thereto, the ends of the arms having an implant engaging structure for securing an intervertebral implant, the arms being resiliently urged towards each other as it is secured to the intervertebral implant, the arms being moveable resiliently away from each other.

28. An instrument according to claim 27, including a pin recess in the facing parts of the upper and lower arms and a pin in the pin recess, whereby movement of the pin out of the pin recess separates the arms from each other.

29. An instrument according to claim 28, including a thumb slide on the body and operatively engaged with the pin to move same out of said pin recess.

30. A method of inserting into an intervertebral space an intervertebral implant having upper and lower recesses, comprising the steps of:

moving the forward ends of an insertion instrument into the recesses of the intervertebral implant such that the ends of the arms of the insertion instrument securely hold the intervertebral implant,

moving the insertion instrument with the implant held therein into the intervertebral space,

and then removing the ends of the arms from the recesses and hence from the implant.

31. A method according to claim 30, including, prior to said step of moving the ends into the recesses of the intervertebral implant, separating the arms of the insertion instrument away from each other, and placing an intervertebral implant into the space between the arms.

32. A method according to claim 31, wherein the separating step includes operating a crossed linkage connected to the arms to move them apart.

33. A method according to claim 32, including moving a threaded rod along the insertion instrument to move the crossed linkage to separate the arms.

34. A method according to claim 33, including the step of closing the arms onto the intervertebral implant, including pushing the two arms of the insertion instrument towards each other, such that the threaded rod moves past its threaded engagement to allow the arms to close onto the intervertebral implant.

35. A method according to claim 30, wherein the step of separating the arms includes providing a resilient body with a pair of arms resiliently urged towards each other, and manually moving the arms resiliently away from each other.

36. A method according to claim 35, wherein the separating step includes moving a pin out of a pin recess and against the two arms to resiliently urge them apart.

37. A method according to claim 35, wherein the step of securing the intervertebral implant comprises allowing the resiliency of the arms to secure them onto the implant.

38. A method according to claim 35, wherein the step of slightly separating the arms from each other for the removing step comprising pulling the resilient body out of the recesses, whereby the natural resiliency of the arms will cause them to rise up over any obstacle and move out of the recesses.

39. A method according to claim 30, wherein the recesses and the ends of the arms have cooperating structures to positively engage each other in the direction perpendicular to the direction of movement into the intervertebral space, and the step of closing the ends in the recesses causes engagement of such positively engaging structures, and the step of slightly separating the arms from each other comprising disengaging the positive engaging structures.

40. A method according to claim 39, wherein the positively engaging structure comprises a projection on each end and an indentation formed in the base of each recess.

41. A method of inserting into an intervertebral space an intervertebral implant having upper and lower parts, comprising the steps of:

securing the upper and lower parts of the implant together with upper and lower arms of an insertion instrument while placing a spacer partially into the space between the upper and lower parts to limit movement of the upper and lower parts towards each other in the vicinity of the spacer.

42. A method according to claim 41, including supporting the spacer on the insertion instrument between the upper and lower arms.

43. A method according to claim 42, including supporting the spacer in a spacer tube fixed to the insertion instrument.

44. A method according to claim 43, wherein the spacer is removably mounted in the spacer tube, and the method includes selecting a spacer of a size appropriate to the size of the implant.

45. A method according to claim 41, wherein the step of securing the upper and lower parts of the implant includes moving the upper and lower arms in a circular path in a scissors like manner about a single pivot axis.

46. A method of inserting into an intervertebral space an intervertebral implant having upper and lower parts, comprising the steps of:

locating the lower part of the implant on the lower arm of an insertion instrument,
moving a spacer onto a portion of the lower part,
locating the implant upper part on the upper arm of the insertion instrument, and
moving the upper and lower arms together to secure the implant, with the spacer located between the upper and lower parts to limit movement of the upper and lower parts together in the vicinity of the spacer.

47. A method according to claim 46, including moving the implant, secured by the arms of the insertion instrument, with the spacer in place, into an intervertebral space and subsequently removing the insertion instrument from the intervertebral space, leaving the implant within the intervertebral space.

48. A method of inserting into an intervertebral space an intervertebral implant having upper and lower parts, comprising the steps of:

securing the upper and lower parts of an intervertebral implant together with upper and lower arms of an insertion instrument which, arms move in a circular path, in a scissors like manner, about a single pivot axis.

49. A method according to claim 48, including positioning a spacer between the upper and lower arms, with a portion thereof located between the upper and lower parts to limit movement of the upper and lower parts towards each other in the vicinity of the spacer.

50. A method according to claim 49, wherein the spacer is dimensioned to create a lordosis angle between the upper and lower parts.

51. A method according to claim 49, wherein the spacer is dimensioned to create a kyphosis angle between the upper and lower parts.

52. A method according to claim 48, including moving the forwardmost ends of the arms into recesses formed in the upper and lower parts.